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ABSTRACT

While a great deal of attention has been directed to the potential value of using symbol systems other than the traditional 26-letter alphabet in the early stages of reading instruction, little attention has been paid to the potential value of using rebuses. In a linguistic sense, rebuses are symbols which represent entire words or parts of words; whereas, by contrast, letters represent sounds. A rebus may be pictorial, geometric, or even completely abstract. To investigate the hypothesis that pupils learning to read with rebuses would do significantly better than pupils presented the same instructional material in traditional orthography (T.O.), two samples of five preschool nonreaders each were exposed to a learning-to-read situation. The results of the study demonstrated that learning to read rebuses was markedly easier than learning to read T.O. Furthermore, the differences became even more disparate as the complexity of the vocabulary and sentences increased. The results implied that learning to read derives its problems and difficulties primarily from the abstract nature of T.O. as a symbol system, not from the nature of the reading process itself. It was suggested that rebuses should be more widely used in beginning reading materials to reduce the learning load on the child. Tables and references are included. (Author/DH)

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REBUS AS A MEDIUM IN BEGINNING READING INSTRUCTION

by

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U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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REBUS AS A MEDIUM IN BEGINNING READING INSTRUCTION[1]

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During the past several years, more educational research has been concerned with the teaching of reading than with any other aspect of the elementary school curriculum. A great deal of this attention has been directed to the potential value of using symbol systems other than the traditional 26-letter alphabet in the early stages of reading instruction. Most notable in this respect have been the numerous studies comparing the efficacy of the Initial Teaching Alphabet (i.t.a.) with that of traditional orthography (T.O.). Very little attention, however, has been paid to the potential value of using rebuses during the early phases of beginning reading instruction.

The term "rebus" derives from a Latin word which means "thing." In a linguistic sense, rebuses are symbols which represent entire words or parts of words, whereas, by contrast, letters represent sounds. A rebus may be pictorial, geometric, or even completely abstract. Figure 1 presents an illustrative rebus vocabulary and a short passage written in rebus.

Figure 1 about here

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[1]The research reported herein was supported by Grant HD 973 from the National Institute of Child Health and Human Development.

Language historians have noted that the earliest forms of written communication were pictographic in nature. Thus a parallel can be observed between the use of pictorial symbols to represent words during beginning reading instruction and the use of pictorial symbols in the historical development of written language. In more recent times, rebuses have been used occasionally, but then only partially, in various types of reading material. Everyone is familiar with the "rebus puzzle" in which a series of pictures connected by pluses and minuses, if correctly solved, will result in a word. Figure 2 presents an example of such a puzzle. Many TV viewers are familiar with the rebus puzzle as an aspect of the TV program, "Concentration."

Figure 2 about here

Rebuses are used as international symbols to facilitate communication, particularly among adults. Road signs as well as pictorial labels on equipment controls, such as tape recorders and automobiles, are examples of the use of rebuses to represent the equivalent words and phrases in various languages.

Rebuses have had occasional use in children's books, both as a novelty and as a purposeful aid in making the text more readable to the child who still has a limited reading vocabulary. For example, the basic reading series published by Harper & Row (O'Donnell, 1966) uses rebuses in the first two preprimers to represent several words which the child has not

yet learned to read in that program. In the Teacher's Edition of Preprimers 1 and 2 the author states:

> The rebus may be used to represent words that have high interest value; so, without imposing upon the pupil the task of learning to read those words, the author is able to write interesting stories of high quality....The use of rebuses makes possible a wider use of the child's speaking vocabulary. (p. T21).

Figure 3 presents a short passage from Jack and Janet, the first preprimer in this series, illustrating its incidental use of rebuses. Rebuses have been used in the same way in Rides of the "Early-to-Read" i.t.a. series (Tanyzer & Mazurkiewicz, 1966).

Figure 3 about here

Rebuses have also been used for their novelty effect in several children's books. For example, Mother Goose in Hieroglyphics was originally published in 1849 and has been recently reprinted (Mother Goose, 1962). Figure 4 presents an example of the text in this book. A similar book has been published by Harcourt, Brace and Company and is entitled Mother Goose Riddle Rhymes (Low, 1953).

Figure 4 about here

The use of rebuses to represent the complete, or virtually complete, text of reading material has had limited exploration and consideration. Woodcock developed a test to predict success in remedial reading (Woodcock, 1958)

which presented to the child the task of learning a vocabulary of 72 rebuses and reading test passages at sight written in this vocabulary. The procedure for teaching the rebuses and administering the test passages took from 30 to 45 minutes per subject. The number of oral reading errors made on the test passages was used as a relative index for predicting success in subsequent remedial reading instruction.

Woodcock and Dunn (1964) proposed the developing of an experimental approach for teaching reading to young mentally retarded children in which the children would first learn to read using a vocabulary of rebuses and later proceed through a transition program in which T.O. words would be gradually substituted for the rebus vocabulary. The development of an experimental program was subsequently carried out as a part of the Peabody-Chicago-Detroit Reading Project (Woodcock, 1967). This project compared six different approaches for teaching reading to young mentally retarded children and involved 120 classes of such children in the cities of Detroit and Chicago. One of these six approaches was an experimental rebus approach which used the Rebus Reading Series (Woodcock, 1965). The Rebus Reading Series is a set composed of eight readers, each consisting of about 60-80 pages of text with associated workbooks, teachers' guides, and supplementary materials for each level of the program. At the completion of the experiment, the children had a vocabulary of approximately 150 rebuses, of which 100 had been transitioned into T.O. The results of this study, after two years of classroom instruction, indicated that there were no significant

differences among the six approaches with respect to reading achievement at the end of a two-year period. Even though the results did not demonstrate the experimental rebus program to be superior, they did demonstrate that, through using these materials, the children learned to read as well as they did by any of the five more traditional approaches.

Out of the work done with this experimental series of rebus readers, a new program for beginning reading instruction has been developed. This program approximates in instructional goals the readiness and preprimer objectives of the traditional programs. The materials used in this approach consist of three programmed texts, two readers of 80 and 72 pages respectively, and supplementary instructional materials (Woodcock, Clark, & Davies, 1968).

Even though rebuses have been used to partially, as well as to completely, represent the text of reading materials, there has been no objective evidence demonstrating the efficacy of using rebuses as a medium in beginning reading instruction. The purpose of this study was to compare the oral reading performance of two samples of preschool non-readers on a learning-to-read task involving five stages of vocabulary introduction, oral reading for practice, and oral reading testing. One sample was presented this task in T.O. while the other sample was presented the same task in rebus. Figure 5 illustrates the design of the study. It was predicted that pupils learning to "read" with rebuses would do significantly better than pupils presented the same instructional material in T.O. Furthermore, it was predicted that this difference, in favor of the rebus sample, would become greater as the vocabulary and sentence complexity of the experimental task increased.

Figure 5 about here

Method

Subjects

The ten subjects for this study were drawn in May, 1968, from the kindergarten of a preschool program for culturally disadvantaged children at the Centenary Community Center in Nashville. The sample was mixed in respect to sex as well as race. Furthermore, these children had had no formal reading instruction as part of their kindergarten program. The examiner randomly assigned five of these children into each of two treatment groups. All of the children were unknown to the examiner and were not seen by him until the time of testing.

Materials

Two sets of materials were prepared for use in the study. These two sets were identical in content and format except that one set was written in rebus while the other set was written in T.O. Each set of material contained five levels of increasing difficulty with two pages at each level. The first page of each level presented a new vocabulary of four symbols, followed by phrases or sentences requiring the child to practice reading the symbols in context. The second page of each level was the test passage on which a record of the oral reading errors made by each child was kept. Figure 6 presents the 20 T.O. and rebus symbols used in this study. The T.O. materials are provided in Appendix B, and the rebus materials are provided in Appendix C.

Figure 6 about here

Procedure

The procedure of the study was as follows:

1. Children went individually with the examiner to a room in the Center which was used for testing purposes. After establishing rapport, the examiner administered a T.O. Word Recognition Test to determine if the subject could already read any of the words used in the experimental materials. A copy of this test is provided in Appendix A. Any child knowing more than two words from this list was to be excluded from the remainder of the study. The examiner pointed to each of the 23 words on the list and asked the subject to say the word. None of the ten subjects could read any of the words from the list, and therefore, none were excluded.

2. The subjects were presented the first page of the experimental booklet used for their treatment group (T.O. or rebus) and were given the following instructions:

> "I am going to show you some words (pictures). I will tell you what they say, then I want you to tell me what they say."

The examiner then pointed to each of the four words or symbols at the top of the first page, telling the child the word for each and asking the child to repeat the word after him. Then the examiner again pointed to each word or symbol and asked the child to tell

him the word for it. If the child made an error, or did not recall the word, the examiner told him the word. Next, the examiner pointed to the first practice sentence or phrase and told the child: "Now tell me what this says," as he pointed to each word in turn. If the subject hesitated for more than four seconds, the examiner supplied the word. If the subject made any errors, the examiner corrected him. There was no returning at any time, for the purpose of review, to symbols or sentences which had been previously read. The procedure was carefully controlled so that each child would respond only once to each symbol printed in the experimental booklet.

When the first page in Level One was completed, that is, the practice page, the examiner turned to page two and had the child to continue reading as he had done with the practice phrases and sentences. The examiner recorded any errors made by the child on an answer sheet (Appendix D). This same procedure was continued through the other four levels. The experimental procedure in either treatment took from 15 to 20 minutes for each child.

3. After reading the second page of Level Five, the child was returned to his room.
4. The criterion data consisted of the number of correct responses given by the subject on each of the five test passages. Appendix E includes the raw data for each subject.

Results

Table 1 presents a summary of the criterion data obtained from the two samples. For purposes of analysis and discussion these data were converted into accuracy scores and cumulated at each level. Figure 7 portrays the results of the study in this form. The cumulated accuracy scores were analyzed by an analysis of variance design which included a trend analysis of performance across the five levels. Table 2 summarizes the results of this analysis. The results indicate a significant difference ($p < .001$), between the two groups in favor of the rebus group. There is also a significant difference in performance from level to level for both groups ($p < .001$), which was to be expected because the scores were cumulated from level to level. In addition, however, there was a significant interaction between medium and level ($p < .001$), with the difference being in favor of the rebus sample, and becoming greater as the complexity of the task increased.

Table 1 about here

Figure 7 about here

Table 2 about here

Discussion

The results of this study demonstrate the relative ease with which children can learn to "read" material written in rebus symbols. It is interesting to note that the number of rebus symbols learned and used by the subjects, in one 15 to 20 minute training session, exceeds the number of words in T.O. learned by the end of the first preprimer in traditional reading programs. Of course, other skills are presented and taught during the readiness and preprimer levels of traditional reading programs. However, the results of this study imply that learning to read derives its problems and difficulties primarily from the abstract nature of T.O. as a symbol system, not from the nature of the reading process itself.

More use of rebuses in beginning reading, to represent either a part or the entire text of beginning reading materials, should be given serious consideration by educators, authors and publishers. Since children can learn rebus symbols so rapidly, instructional materials using rebuses may provide a much easier beginning program in reading than those using T.O. exclusively. With rebus materials the child is immediately able to attend to the meaning of the passage, and other aspects of the reading process, rather than primarily to the translation of a difficult system of symbols. Furthermore, the question is raised whether the traditional readiness programs associated with many reading approaches are not artificial, and perhaps unnecessary. The facility with which the rebus subjects in this study acquired and demonstrated the ability to handle the process of reading suggests

that the need for readiness programs has come about not because children need a careful introduction to the left-to-right pattern in reading, visual discrimination training, and so on; but as a result of a more generalized picture of confusion presented by children faced with learning a very abstract symbol system. In short, the five disadvantaged children used in this study, learned to "read" rebuses in a very few minutes even though they had not yet gone through a formal "reading readiness" program.

Summary

This paper reports a study in which two samples of five preschool nonreaders were exposed to a learning-to-read situation. The children were presented a vocabulary of 19 words, and the -ing inflectional ending. The subjects then read passages written with this vocabulary. Five of the children were presented with the vocabulary in rebuses; the other five children were presented with the same vocabulary in traditional orthography. The results of the study demonstrate that learning to "read" rebuses is markedly easier than learning to read traditional orthography. Furthermore, the differences become even more disparate as the complexity of the vocabulary and sentences increase. It is suggested that rebuses should be more widely used in beginning reading materials to reduce the learning load on the child.

00012

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Woodcock, R. W., Clark, C. R., & Davies, C. O. The Peabody Rebus Reading Program. Circle Pines, Minnesota: American Guidance Service, 1968.

Table 1. Summary of Criterion Data by Level

Level	Statistic	Treatment T.O.	Rebus
1	$\bar{X}$	1.60	4.80
	s	1.79	0.89
	Range	1 to 3	4 to 5
2	$\bar{X}$	3.20	12.60
	s	3.58	4.15
	Range	1 to 5	9 to 14
3	$\bar{X}$	4.60	26.20
	s	5.02	4.98
	Range	1 to 7	22 to 28
4	$\bar{X}$	7.20	45.20
	s	7.40	7.13
	Range	2 to 12	40 to 50
5	$\bar{X}$	9.80	70.40
	s	11.26	14.25
	Range	3 to 16	63 to 81

Table 2. Analysis of Variance: Reading Medium and Trends by Level

Source of Variance	df	ms	F
Between Subjects			
Medium (A)	1	475312	151.30***
Error between	8	3141	
Within Subjects:			
Linear regression by level (B)	1	193688	425.30***
AB	1	114312	251.01***
Error within	8	455	
Quadratic regression by level (C)	1	15.80	0.24
AC	1	34.01	0.52
Error within	8	65.04	
Cubic regression by level (D)	1	27.04	1.44
AD	1	67.24	3.58
Error within	8	18.79	
Quartic regression by level (E)	1	16.05	0.78
AE	1	69.14	3.37
Error within	8	20.50	
Total	49		

*** $p < .001$

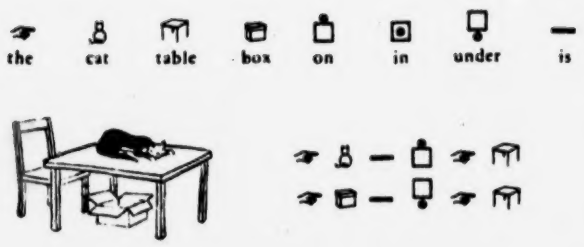

Figure 1. Illustrative rebus vocabulary and passage.

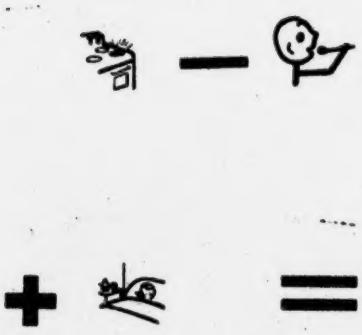

Figure 2. Example of a simple "rebus puzzle." If solved correctly, "hill" is obtained as the answer.

00016

Come in, Mark.

Come and see my .

See my two .

See the two .

See my .

Figure 3. Example of the occasional use of rebuses in pre-primers.

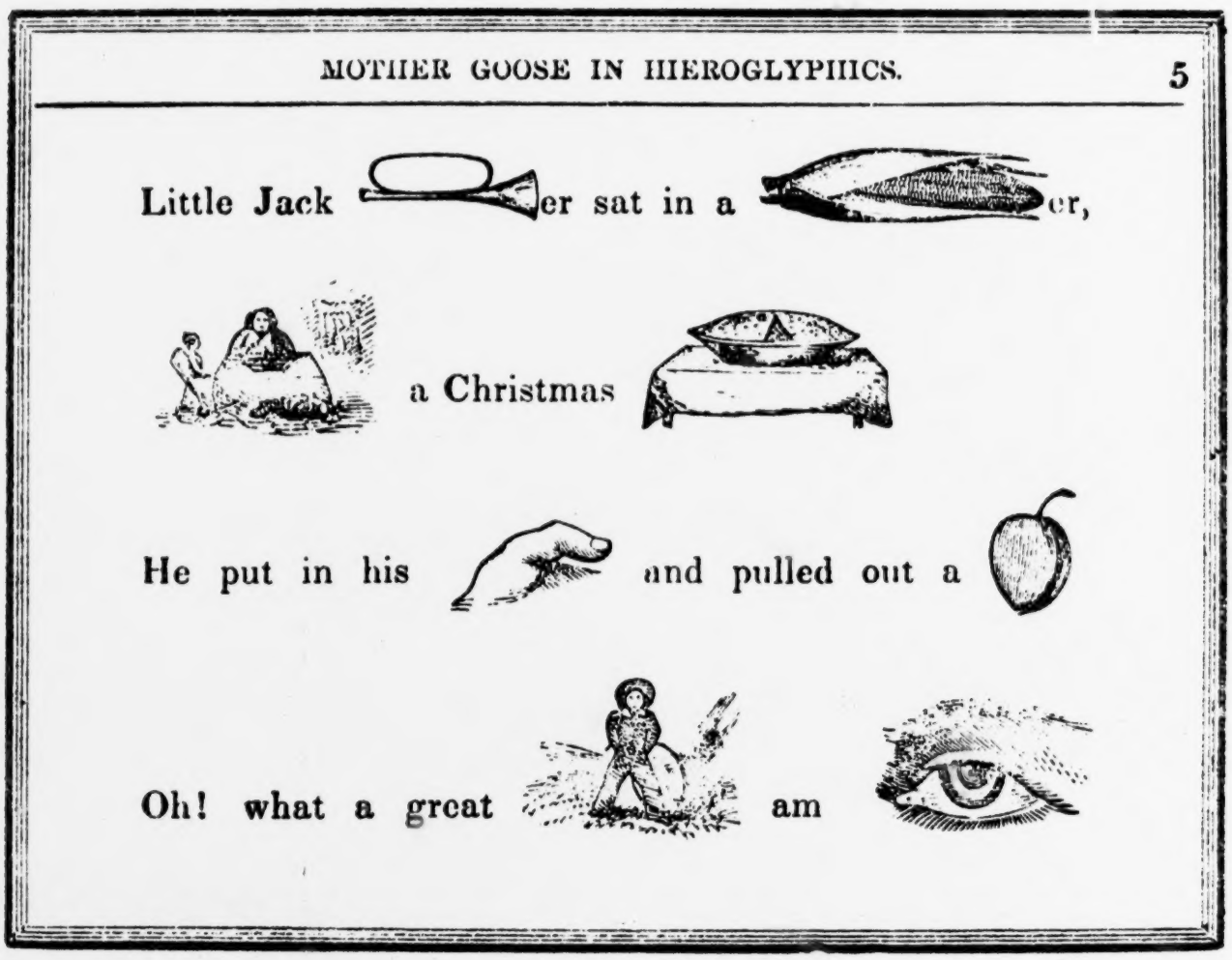

Figure 4. Example of the use of rebuses for their novelty effect in a children's book.

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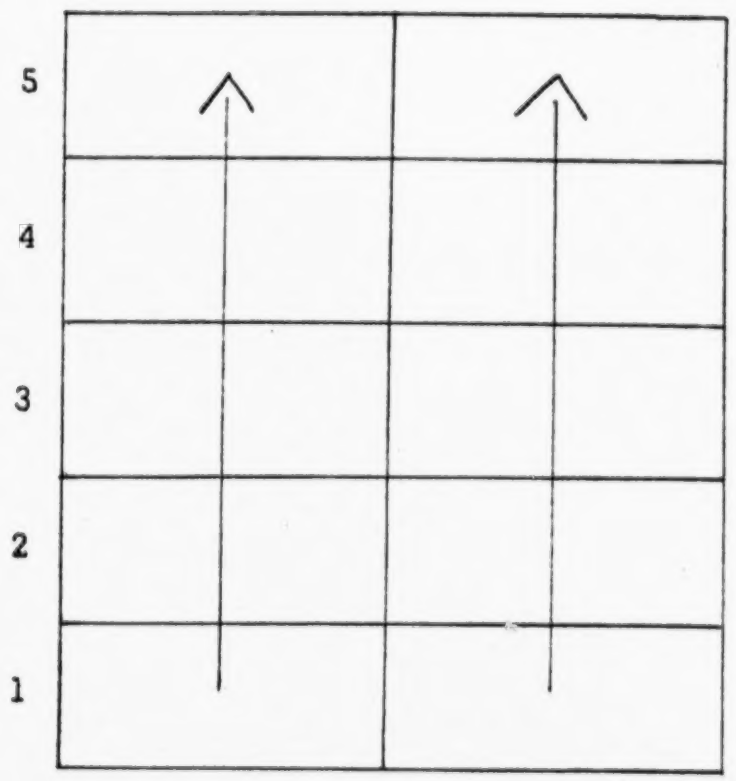


Figure 5. Design of the rebus efficacy study.

Figure 6. The vocabulary of 20 rebus and T.O. symbols presented by level in the experimental materials.

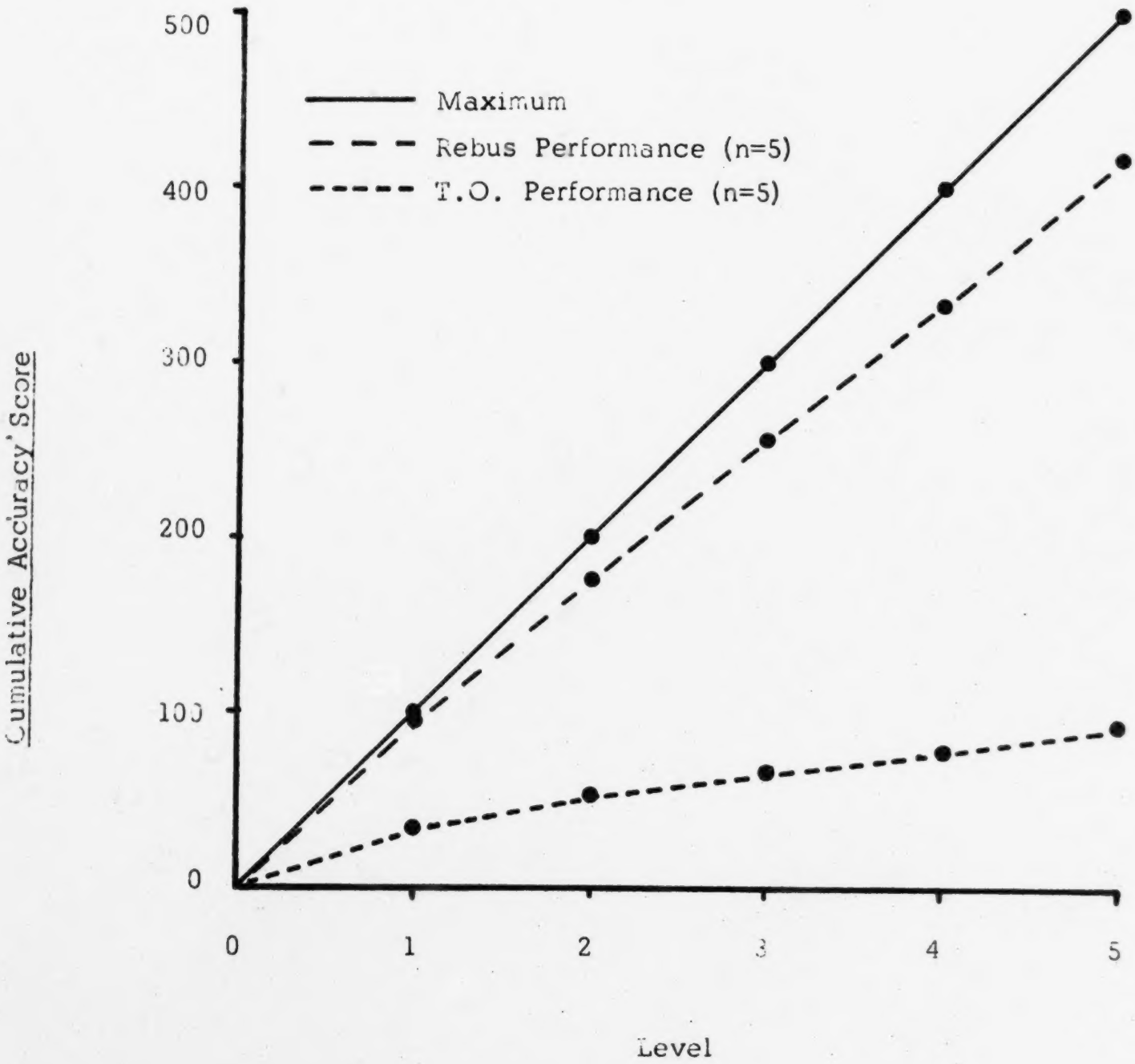


Figure 7. Cumulative accuracy scores across levels for T.O. and rebus subjects.

APPENDIXES

Appendix A -- T.O. Word Recognition Test

Appendix B -- T.O. Stimulus Materials

Appendix C -- Rebus Stimulus Materials

Appendix D -- Answer Sheet

Appendix E -- Raw Data

00022

Appendix A

_____Rebus
_____T.O.

REBUS EFFICACY STUDY

T.O. Word Recognition Test

ame _____ Age _____ Grade _____ School _____ Dage _____

ther Information:

_____cowboy	_____sit	_____horse
_____black	_____little	_____sitting
_____ride	_____seeing	_____under
_____can	_____in	_____see
_____on	_____house	_____white
_____walking	_____and	_____riding
_____dog	_____walk	_____big
_____the	_____is	

Results: No. Correct

. W. Woodcock

cowboy horse dog and

cowboy and horse

dog and horse

1

horse and cowboy and dog

black white the is

The dog is black.

The horse is white.

The horse and the cowboy.

The dog is black and white.

00025

ride walk sit can

The dog can sit.

The horse can walk.

The cowboy can ride.

The cowboy can ride the white horse.

The dog is black and can sit and walk.

big little see -ing walking

The big dog can see the horse walking.

The little cowboy is riding the horse.

The black and white dog is sitting.

The little cowboy can see the big dog sitting.

The cowboy is riding the black and white horse.

The horse is walking.

00027

in on under house

The dog is sitting under the white house.

The cowboy is riding on the black horse.

The little dog is walking in the big house.

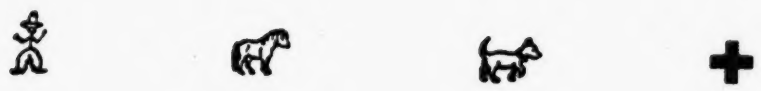
The cowboy can see in and on and under the house.

The little cowboy is riding on the big horse.

The white dog is walking under the house.

The black dog is sitting in the house and can see the horse.

Appendix C



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p 2

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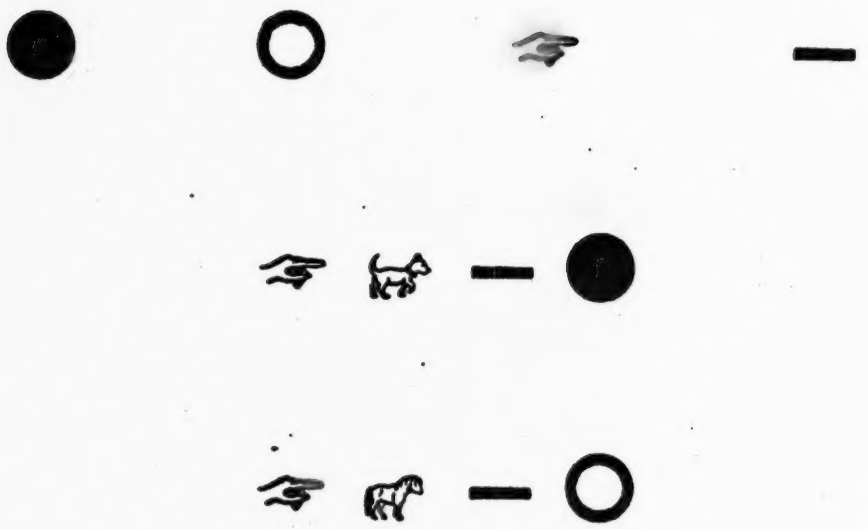

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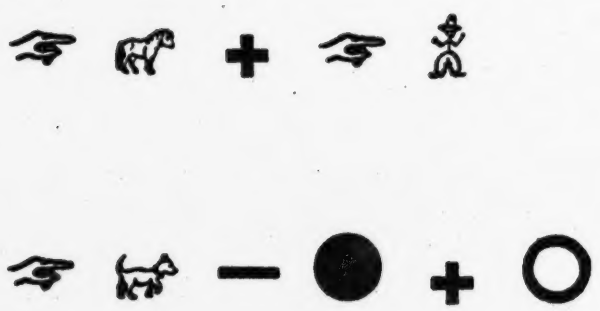

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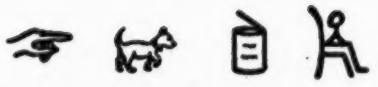

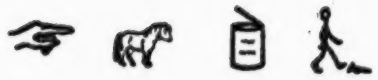

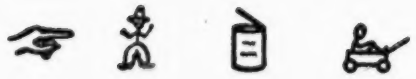

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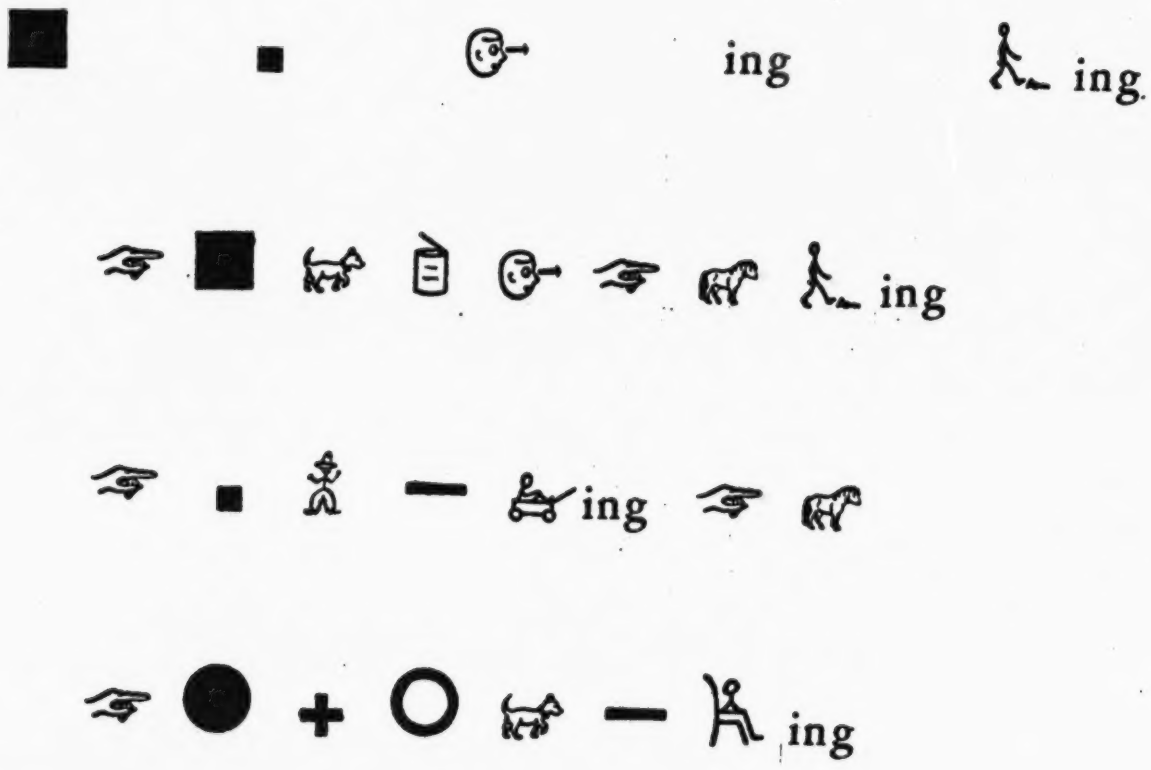

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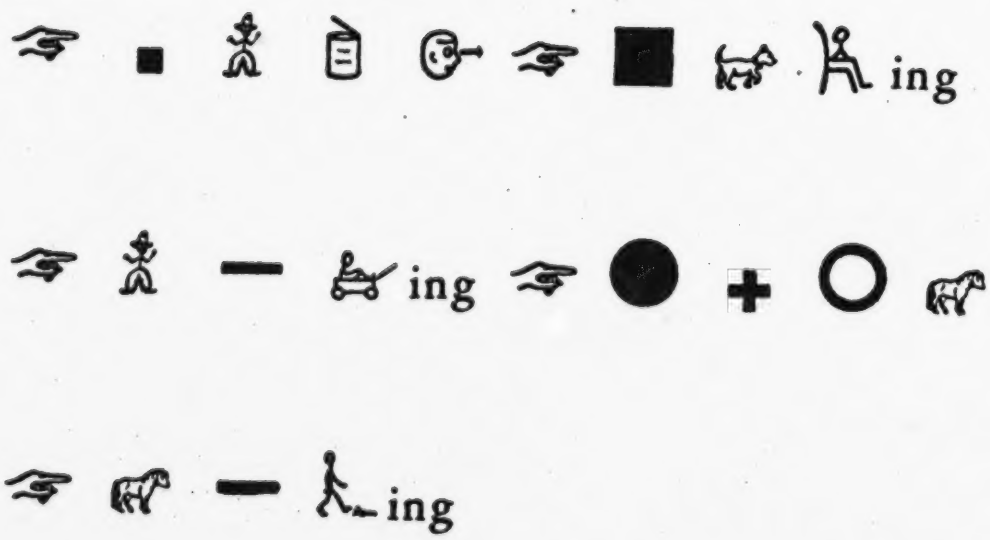

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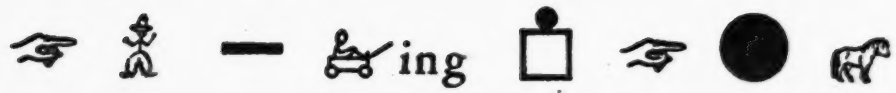

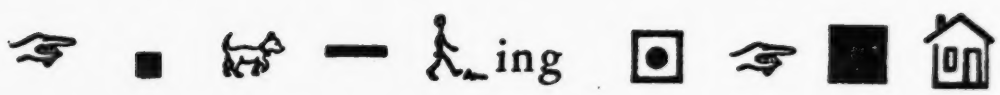

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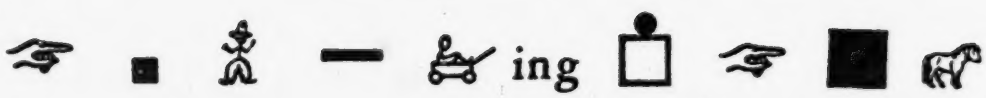

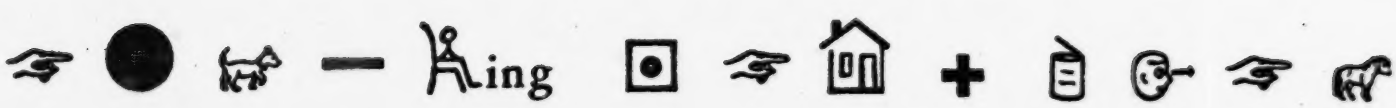

p 10

REBUS EFFICACY STUDY _____ Rebus
_____ T. O.

Learning Task

Names _____ Age ____ Grade ____ School _____Date _____

Instructions: I am going to show you some (words pictures). I will tell you what they say, then I want you to tell me what they say.

Page 2:

Horse and cowboy and dog

Errors _____

Page 4:

The horse and the cowboy.

The dog is black and white.

Errors _____

Page 6:

The cowboy can ride the white horse.

The dog is black and can sit and walk.

Errors _____

Page 8:

The little cowboy can see the big dog sitt/ing.

The cowboy is rid/ing the black and white horse.

The horse is walk/ing.

Errors _____

Page 10:

The little cowboy is rid/ing on the big horse.

The white dog is walk/ing under the house.

The black dog is sitt/ing in the house and can see the horse.

Errors _____

Total Errors_____

Appendix E

Raw Data

Subject	Treatment	Number Correct by Level 1	2	3	4	5
1	T.O.	3	2	2	0	2
2	T.O.	2	3	1	6	4
3	T.O.	1	0	0	1	1
4	T.O.	1	2	0	3	0
5	T.O.	1	1	4	3	6
6	Rebus	5	9	13	19	28
7	Rebus	5	8	13	19	22
8	Rebus	5	8	15	22	31
9	Rebus	5	9	14	17	22
10	Rebus	4	5	13	18	23

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